END SEMESTER EXAMINATION MAY-2024

Course Name: - B.Tech **Semester:- VI**

Paper Name: - Compiler Design **Paper Code:- TCS-602**

Time - 3 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय– 3 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। अधिकतम अंक–70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries 3 mark. All questions are compulsory.
- Section B- Answer any 5 out of 6 given questions in maximum hundred (150) words. Each question carries 7 marks.
- Section C- Answer any 2 out of 3 given questions in maximum five hundred (500) words. Each question carries 10 marks.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न तीन अंक का है। सभी प्रश्न अनिवार्य हैं।
- खण्ड–ब में छः प्रश्नों में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें। प्रत्येक प्रश्न सात अंक का है।
- खण्ड–स में तीन प्रश्नों में से किन्हीं दो प्रश्नों के उत्तर अधिकतम (300) शब्दों में दें। प्रत्येक प्रश्न 10 अंक का है।

Section – A (खण्ड–अ)

Objective Questions (वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. 5×3 =15

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) The lexical analyzer takes ____ as input and produces a list of ___ of output.
   a) Machine code, mnemonic
   b) Token, source code
   c) Source code, token ✓
   d) Both a and b

ii) A compiler for a high-level language that runs on one machine and produce code for different machine is called
   a) One pass compiler
   b) Multi pass compiler
   c) Cross compiler ✓
   d) Optimizing compiler

iii) Which derivations is generated by bottom-up parser?
   a) Leftmost derivation
   b) Leftmost derivation in reverse
   c) Rightmost derivation ✓
   d) Rightmost derivation in reverse

iv) Which of the following parsers is the most powerful?
   a) SLR
   b) LALR
   c) Canonical LR ✓
   d) Operator -precedence

Follow(E) = {), $}
(E') = {+,)}
T = {+,), $}
T' = {), +, $}
F = {*, +,), $}

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v) Type checking is normally done during
   a) Code optimization
   b) Syntax direction translation
   c) Lexical analysis
   d) Syntax analysis

Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any five of the following questions in maximum 150 words. **5×7=35**
निम्नलिखित में से किन्हीं पाँच प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i. How parsing techniques are classified?

ii. Construct the NFA for the following regular expression $(0+1)^*(00+11)(0+1)^*$

iii. What is LR parser? How it is different from SLR.

iv. Discuss the merits and demerits of single pass and multi pass compiler

v. What are the advantages of DAG? Explain the peephole optimization.

vi. Define the following a) regular grammar b) context free grammar.

vii. Calculate LR(0) items for the following grammar

S'→.S

S→L= R / R

L→*R/ id

R→ L

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 300 words. **2×10=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 300 शब्दों में दें।

i) **(a)** Differentiate between complier, interpreter and assembler

(b) Construct predictive parsing table for the following grammar

S→ iEtSS' / a
S' →eS / ε

ii) **(a)** Differentiate between SDD and SDT

(b)Write TAC for the following

If A<B and C<D then t=1 else t=0

iii) **(a)** Find FIRST and FOLLOW of each variable in the following grammar

E→TE'
E'→+TE' / ε
T→FT'
T'→*FT'/ε
F→ (E) / id

(b) Write short notes on a) Loop optimization b) global data analysis

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